

Single Crystal Piezoelectric Deformable Mirrors with High Actuator Density and Large Stroke, Phase II

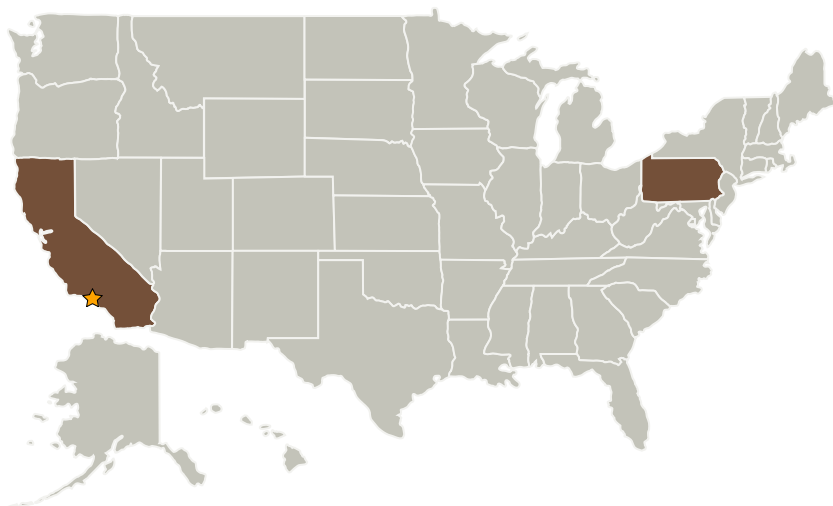
Completed Technology Project (2009 - 2011)



Project Introduction

Single crystal piezoelectric deformable mirrors with high actuator density, fine pitch, large stroke and no floating wires will be developed for future NASA science and communications applications. Single crystal piezoelectric DMs share the fine pitch with co-fired electrostrictive or ceramic piezoelectric DMs and MEMS DMs, but with large stroke at relatively low voltages (< 150 V) and with a broader operation temperature range (< 20 K - > 300 K). Specifically, a 32×32 actuator array with stroke > 2 μm , pitch of < 1 mm and a 8×8 actuator array with stroke > 12 μm , pitch of < 2 mm will be developed for fine and coarse DMs. Actuator driving electronics will be scaled up to a multi-channel actuator driver and optimization of the design, facesheet mounting process and characterizations for deformable mirrors will be investigated.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
TRS Ceramics, Inc.	Supporting Organization	Industry	State College, Pennsylvania



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Pennsylvania

Project Transitions



January 2009: Project Start



July 2011: Closed out

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.2 Electro-Mechanical, Mechanical, and Micromechanisms